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# Understanding the Shaping, Incorporation and Coordination of Health Technologies through Qualitative Research

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## INTRODUCTION

In the past two decades or so, health technologies have increasingly become a topic for qualitative social and health researchers. An intensification in the development, evaluation and use of technology in health care (Clarke et al., 2003) has drawn qualitative researchers into the problem of technology, often supported by the needs of policy makers to understand the 'human factors' leading to its implementation and uses. Within the social and health sciences, understanding the role of technology in health care also became an integral part of the work of analysing the social and cultural organization of health and illness in the later part of the twentieth century (Strauss et al., 1985). Yet, by the beginning of the twenty-first century, Heath et al. (2003), could still complain that many researchers have 'been a little reticent in exploring the ways in which ... technologies feature in everyday practice in work and organizations' (76). In this chapter, we take this reticence as a challenge. Our aim is not to review qualitative research on health technologies (see Lehoux, 2006; Webster, 2007) but to provide a set of problematics, contexts and exemplars for the use of qualitative research to understand health technologies.

The first difficulty in achieving this aim is the very definition of health technology. Most of us would agree that medical imaging apparatuses such as Positron Electron Tomography or diagnostic tests such as genetic screening are examples of health technologies. How many would, however, see paper-based patient records as another example (Berg, 1996)? When in the beginning of the twentieth century, a variety of instruments and diagnostic tools were introduced in (mostly American) hospitals, some clinical commentators voiced concerns about the diminishing role of clinical judgment in health care (Howell, 1995), forgetting that those cherished skills had themselves only recently come into being, supported by other 'clinical' technologies such as the patient-centred record (Berg and Harterink, 2004). Rather than showing us the shortsightedness of practitioners, this example alludes to the methodological problems involved in identifying and studying health technologies. The definition of what counts as a medical or health technology is often entangled with the degree of *novelty* ascribed to the object/technique in question (Brown and Webster, 2004), and this is frequently embedded in scenarios of change proposed by groups of actors. In this chapter, we focus on a range of technologies, from ultrasound to pharmacological therapies to paper-based clinical guidelines.

Realizing the negotiated and contested character of health technologies is a point of departure to understand their role in health care. This means that not only their definition but also their uses and their very design are prone to change in interaction with the social relations around them. This perspective, which Timmermans and Berg (2003) have called 'technology-in-practice' and Heath et al. (2003) have called 'technology in action', allows qualitative researchers to focus on technology, without either reifying its power ('technological determinism') or seeing it simply as the product of 'social construction'. Our suggestion is that qualitative research methods are ideally suited to understand these interactive processes between technology and society: they can capture how practices, discourses and identities enter in dynamic relationships with the shape, design, requirements and effects of technologies.

In what follows, we focus on three domains where these dynamic relationships are particularly important. In the first section, we explore how such technologies come into being: how socioeconomic, professional and cultural contexts shape the design of health technologies and how such devices come to embody versions of patient and professional identities and desires and the social organization of health care. In the second section, we investigate how technologies – and their embedded social contexts – arrive in clinical practice or patient's homes, how they are incorporated, challenged, modified or rejected in these contexts. In the final section of the chapter, we delve into technologies as coordinating devices, bringing together different practical, professional or moral worlds.

## SHAPING TECHNOLOGIES

Where do health technologies come from? One remarkably prolific perspective is that of economics, which provides us with two general answers. One emphasizes

the role of advances in science or technology in proposing new drugs, devices or procedures – this is known as the ‘science push theory’. Another answer emphasizes the role of market demand in pulling the development of innovation – thus known as ‘demand pull’ theory. In fact, a growing number of researchers agree that the knowledge and engineering base interact with the complex social processes of identification of ‘need’ (Mowery and Rosenberg, 1989).

Rather than seeking general answers to this question, social and health scientists in the field of medical anthropology, medical sociology and science and technology studies, have mostly written case studies, based on archival, documentary or more rarely ethnographic research (May and Ellis, 2001), to understand the interaction between technology and society. There are two methodological reasons for this. If one is to engage with and understand the ‘contents’ of science or technology as well as their ‘context’ (Callon and Law, 1989), it is appropriate to limit oneself to one particular domain of innovation. This is not only a pragmatic consideration, it also attends to the demands put on qualitative researchers when entering and trying to understand social contexts that are at once intuitively familiar – after all we live in highly technological societies – and remarkably strange – most social and health scientists are not trained in the specific fields of science or engineering that they are studying (Hirschauer, 1994; Lynch, 1994). The second consideration is linked with the kind of knowledge that is derived from a case-oriented approach. As ‘meaningful but complex configurations of events and structures’ (Ragin, 2004: 125), cases provide detailed insight into the processes that shape health technologies.

One particularly useful example of this is Yoxen’s (1987) study of the development of ultrasound as a diagnostic technology. Initially developed for marine navigation and naval warfare purposes, sonar later became a useful technology in manufacturing and was first tested in medicine for its potential curative properties before it moved into neurology and obstetrics. Yoxen’s question concerns the processes by which the ultrasound was seen to ‘work’ in the clinical context and argues that this question cannot be answered without considering the views of the different professions involved in developing and evaluating this technology. Yoxen shows how the development of the technology as a ‘health technology’ was only possible, because it became entangled with the consolidation of radiology as a profession and as a distinct form of expertise. Images gained meaning insofar as they related to the development of the specific role of radiologists as ‘interpreters’ of ultrasound in health care organizations.

What the case of ultrasound brings to light is how the delineation of a technology is underpinned by a mutual adjustment between the understanding of disease, the technological means used to depict or cure it and the actors that are deemed to carry out such actions. In this, the ‘success’ of a technology is often equivalent to the validation of specific professional perspectives on illness and the human body and on the organization of health care. In the case of cerebral angiography, a widely used technique of visualizing blood vessels through the injection of contrast dye, the usefulness of the technology only became fully available in tandem

with neurosurgeons' newly found clinical leadership in defining and treating pathologies of the central nervous system around the middle of the twentieth century (Moreira, 2000). This entailed abandoning surgeons' reliance on neurologists' diagnosing skills and, concurrently, neurosurgeons' developing their own means of correlating structure and function so as to achieve precise localization of lesions. It is also from this perspective that professional resistance to medical innovation should be interpreted. When in the 1910s–1920s the sphygmomanometer, formerly a physiological instrument used to measure blood pressure in laboratory experiments, was championed by some American clinicians in order to make medicine more scientific and 'precise', critics emphasized that such innovation would move doctors away from embodying diagnostic skills which they saw as crucial to the trade (Evans, 1993). In this, critics were also proposing a version of clinical medicine where doctors were more concerned with the 'stories' and bodies of patients than with instrumental measurements, and a version of health care where doctors were less reliant on 'science' and 'technology' to make decisions.

This example, leads us to our next topic: the way in which health technologies embody particular version of patients, their role and identities. In her study of the emergence of foetal surgery, Casper (1998) suggests that the consolidation of the knowledge, techniques and technologies that support such approach was only possible through the construction of a new identity, a new patient, that of the 'the unborn child', in detriment of the concerns and interests of pregnant women. This, she argues, was in turn only possible because of how proponents of foetal surgery related the possibility of knowing and treating the foetus to wider concerns about the politics of reproduction and abortion in the 1960s–1970s.

Indeed, the embodiment of patient's roles in technology appears often linked to wider social, contested understandings of health and illness and life-course expectations (Brown and Webster, 2004). The development of new pharmaceutical technologies, like drug therapies for Alzheimer's disease since the 1970s, is a good illustration of this. Behaviours formerly seen as characteristic of 'old age' became framed within a coherent etiological model, and this shift contributed to the establishment of a broader societal understanding of 'normal ageing' (Holstein, 2000) that excluded cognitive decline ('memory loss'). The development of Alzheimer's therapies became linked to a version of 'abnormal ageing' that focuses attention on cognitive abilities and particularly memory (Moreira, 2009). Access to such therapies in mainstream systems of health care is mediated by an assessment where patients' insight into their illness is contrasted and 'checked against' cognitive tests and 'informants' interviews' (normally the main carer). In this way, patient's reduced cognitive agency is both presupposed and enacted by the drug that is deemed to alleviate it. From this perspective, the drug embodied a categorization of disease and correlated illness identities that focused on 'memory' rather than on the, arguably more important, behaviour and emotional features of dementia.

Does this mean that patients are excluded from participating in the negotiations that lead to the development of health technologies? Although there are now

policies to involve 'consumers' in health research programmes, little is known about the roles and contribution they offer (Boote et al., 2002). One problem might be the way in which consumer involvement is 'framed' within public institutions. Harrison and Mort (1998), for example, have argued that these practices of involvement could be seen as 'technologies of legitimation' of previously taken managerial decisions. Patients are brought in as 'consumers' to exercise 'choice' about already predefined or delineated technologies or services (Mol, 1999). There are trends in the opposite direction, however, that move beyond individuals simply acting as the obligatory 'voice of the patient' on public decision-making committees and groups (Caron-Flinterman et al., 2005). In this context, Callon and Rabearisoa (2008) show how, instead of relying on 'experts' to define technological expectations, some patient groups are able to harness the knowledge and uncertainty that surround their illness to forge new collaborative networks across traditional expertise lines and move technological development into unpredictable avenues. In this way, different forms of articulation between research, development and political identities are emerging.

## INCORPORATING TECHNOLOGIES

How do technologies come to be integrated in the organization of health care? How do they affect and interact with health care work? Answering this question has been the focus of concern for many policy makers and researchers for a number of years, particularly as there are increasing demands to make health care more effective and efficient (Banta, 2003). Research has focused on assessing whether cost and effectiveness justify such use rather than understanding the social, political and cultural dimensions that are deployed by these technologies (Lehoux and Blume, 2000). Only recently, a consistent body of work became interested in how technologies interact with health care work.

One consistent feature of qualitative studies of these processes is that, instead of assuming that technologies will 'naturally' diffuse into ever expanding contexts – unless impeded by external factors (Coleman et al., 1966) – they sought to explore the conditions and practices through which implementation actually happens (May et al., 2003). In this area of work, researchers are aware of the issues we discussed in the last section: that technologies have social and organizational forms embodied or 'written into' them. Once a technology acquires a distinctive and more or less stable shape, it can be said to have a 'script' delineating the relationship between social and technological actors that will make it 'work' (Akrich, 1992). When a technology is put in place, it is rarely the case that its specifications will match the reality of the working environment it encounters. What follows can best be described as a mutual adjustment between the newly arrived technology and the contexts of practice, leading often to rearticulations of both technologies and social relations. For example, in an ethnographic study of cardiopulmonary resuscitation (CPR), Timmermans (1999) suggests that this technique's 'script' implies that staff's reaction to sudden death should follow

procedures that exclude emotional concerns for the person. In practice, however, staff and family members are able not only to include such concerns within CPR situations but also to produce through it 'new' meanings to the process of sudden death. The very technology that was supposed to prevent death is used as a resource in explaining and describing the process of dying and so helps family members come to terms with their unexpected loss.

One should, however, avoid thinking that this mutual adjustment leads to an increasing 'convergence' and 'tight fitting' between technology and implementation setting. As Berg (1998) has argued, technologies 'persist because of the existence of loose ends and different logics' (168). The mutual adjustment is a continuous, fluid, ongoing process. For example, research on protocol-driven tasks – be they working with computerized 'expert' systems (Whalen and Zimmerman, 1987; Whalen, 1995) or completing quality of life questionnaires (Antaki and Rapley, 1996) – shows how such technologies shape and are intimately shaped by and adapted to their moment-by-moment enactment. Greatbatch et al.'s (2005) study of audiotapes of calls to a telephone triage system, NHS Direct, highlights how a technology aimed at standardizing medical advice is actually used in practice.

In the United Kingdom, patients or their representatives can call NHS Direct for health advice and information. With the nurse-led aspect of the service, once the nurses have established the patient's symptoms and past medical history, they select a symptom-based algorithm from the computerized clinical assessment system (CAS), and ask a series of questions prompted by CAS. They input the information from patient's answers and CAS offers expert clinical judgement: an on-screen 'disposition' (e.g., 'Contact GP within 4 hours [as soon as possible]') and advice (e.g., 'Drink a warm drink with lemon and honey to soothe a cough'). In some cases, nurses work through CAS and then simply tailor advice that the system provides. At other times, they override CAS:

*Nurse:* So what I sugge – I mean what it's advising me is for you – for you to go to Accident & Emergency but (...) you know I think you'd better go to see your GP today. You ring them up.

*Caller:* Yeah.

*Nurse:* You tell them that you've been in touch with NHS Direct.

*Caller:* Yeah.

*Nurse:* And that we've advised you that you be seen. Because (...) uhm maybe – I'm just looking at your age may be your blood pressure's gone up for some reason.

(Simplified Transcript; Greatbatch et al., 2005: 817)

When nurses shift from a CAS-based recommendation, they have to account for their reasoning, by typing this into the system. Moreover, this requirement nicely illustrates the ideals embedded in CAS: acts of individual expertise or judgement are inherently secondary.

In all cases, whether the CAS disposition and advice is simply reported, under-ridden or overridden, the nurses 'adapt, tailor, qualify and supplement' (ibid: 425) CAS recommendations drawing on their individual experience and expertise.

Greatbatch and colleagues argue that any ideal of the standardization of the delivery of care through the CAS is a practical impossibility. Not only does it go against the professional discourse of nursing, in that they work with patients as 'individuals', but also that all rule-based systems are based on ideals and abstractions, yet any rule-following relies on adaptation to the case-at-hand (Garfinkel, 1967). In addition, such protocol-driven systems can deny the phonetic judgments (Flyvbjerg, 2001), the practical wisdom that people employ in interaction with others. For example, is this person just phoning for reassurance? Technologies like telephone triage transform the process of care delivery and in so doing, shift the rights and responsibilities of the parties involved. Notably, it redistributes trajectories of care increasingly towards the space of the home and community, extending the regime of self-care.

Linked to these shifts in the responsibility of care and a perceived increased burden of chronic illness, policy makers have recently advocated an emphasis on community care supported by new arrangements between health and social care, ambulatory services and the domestic use of monitoring and maintenance technologies. Information and communication technologies are seen as key in this development, as they can potentially improve current methods and facilitate new ways of delivering health care (Royal Society, 2006). Therefore, it is important to be able to understand how technologies' specifications interact with the domestic environment and the social practices within it. This is the task that qualitative researchers are uniquely equipped to do as they are able to describe how households deploy complex relationships between patterns of consumption, illness identities and social networks that cannot be fully compatible with the intentions of technology designers and the recommendations of researchers and professionals (Lehoux et al., 2004; Mort et al., 2008). Indeed, a consistent finding of qualitative studies of telecare is that the incorporation of these devices requires a variety of forms of work from the patient and household members (see similar discussion in Chapter 2).

In a case study of the ambulatory Electro Cardiogram recorder in the Netherlands, Oudshoorn (2008) found that, while procedural tasks were written as instructions to patients, these instructions assumed an expertise of patients as diagnostic agents: they are expected to catch the right moment to register an ECG that shows their heart rate dysfunction. This is a very difficult task, because patients not only have to learn to master the new technology but also learn how to 'read' their bodies in view of the requirements of the technology. This, in turn, entails shifts in the temporal routine of households and adjusting illness identities accordingly. In effect, such practices and identities are not fully malleable, and users who cannot or will not meet the requirements scripted in technologies are at risk of being excluded from these new digital health care services. A useful case to understand this process concerns Continuous Positive Airway Pressure (CPAP), an airflow generator used to prevent the onset of apnoeas during sleep. In a study of a Web-based discussion group about sleep disorders and sleep apnoea, Moreira (2006) found that the 'successful' incorporation of CPAP at



home was linked to the deployment of a 'collective expertise' amongst patients. With little help from clinicians or sleep researchers, patients assembled specific and practical knowledge on how to use and adapt the technology. This enabled them to physically alter their sleeping environments and to extend their use of CPAP at home.

It appears that users' role in the successful incorporation of technologies requires much more than following 'doctor's orders'. Incorporation also implies that users try out – at different times in their illness trajectory – different arrangements between their routines and the requirements of the technology. Through such continuous and dynamic adaptation, these devices can become *tools of care* (Willems, 1995) in that they enable users to construct a form of embodied expertise that is specific to their individual situation and so supports them in the day-to-day management of their illness.

## COORDINATING TECHNOLOGIES

How do health technologies contribute to the organization of social life? In a variety of ways, this question has been answered already in the preceding sections. From another point of view, we have mostly explored how technologies shape, and are shaped by, health care – from interactions between health professionals and patients to health expectation of the wider population. It has been argued that, in advanced capitalist societies, we are observing a shift from the problem of disease to the problem of health (Crawford, 1980). According to this approach, the focus is not on how to 'restore' health – the main focus of health care – but in how to *maintain* or *not lose it*. This entails changes in the way health is researched and managed, in the way authorities govern populations through epidemiological surveillance, screening programmes and health promotion initiatives and in the technologies used to deploy such policies.

One of the important consequences of this shift is at the subject level, as individuals are expected to draw on ideas about the future in the organization of their present conduct (Armstrong, 1995). Social scientists have emphasized that a new conception of the self emerges as risk is individualized. Drawing on Foucault's (1991) concept of *governmentality*<sup>1</sup> – social studies of health risk have suggested that these changes are themselves linked to a shift in the responsibility of care from professionals to collaborations between patients and clinicians and an emphasis on individual monitoring of lifestyle choices. The prominence given in contemporary societies on 'choice' is underpinned by a particular conceptualization of individuals as rational calculative subjects. In the past decade, studies have focused on how technologies such as the Internet (Nettleton and Burrows, 2003) give body to this type of citizen and enable the forms of subjectivity that underpin such political order. New technologies of risk that enable policy actors, clinicians or patients to develop, collect, discuss and act on risk-based

information, have become increasingly significant. In recent years, we have seen the expansion of paper, audio, video and web-based decision support tools to be used in clinics and at home, with the aim to assist patients and their family in making treatment and lifestyle decisions (May et al., 2005).

The issue of accountability is particularly important to understand changes in health in contemporary society. Attention has focused on a new range of 'technologies of accountability', focusing on how clinical practice is coordinated through technologies like guidelines, care pathways and other such local and national policy statements. These initiatives attempt to align everyday managerial and clinical working practices, increasingly demanding that the worlds of practice are informed by 'the judicious use of evidence' about what is clinically and cost-effective. Research has focused on how these technologies are developed (Moreira, 2005; Will, 2005) as well as how they interact with clinical work (Tanenbaum, 1994; Gabbay and le May, 2004). They are evidence that systems of regulation and the establishment of standards are becoming internal requirements for biomedical knowledge production and clinical work, rather than simply forms of external control by the State, employers or the 'public' (Cambrosio et al., 2006) (see similar discussion in Chapter 3).

Another perspective on the coordinating power of health technologies is concerned with how technologies can bring together or break apart the different pragmatic worlds we as social actors navigate in our everyday lives. Drawing on Boltanski and Thevenot's (2006) explorations of the multiple forms of justification through which people legitimize their actions, there has been increased interest in understanding the role of technologies in such processes (Berg and Mol, 1998). In an ethnographic study of asthma therapies, Willems (1998) demonstrates how different regimes – inhaler vs. oral medication – give rise to different practical worlds underpinned by differently enacted 'lung geographies'. For inhaler users, therapy is dependent upon their 'technique' of deployment of the device so that the drug is effectively delivered through the lung as 'a tree with ever finer branches'. This makes it important for users to learn how and when to use the inhalator. Oral medication users are less burdened with these issues as they can rely on the heart to deliver the therapeutic agent to the lungs. This means that they are less able to control and understand the relationship between activities in their lives and the onset of breathing difficulties.

Health technologies can also enable the coming together of worlds that illness has set apart. Willems, again drawing on the case of asthma therapies, argues that one important way of looking at the effectiveness of technologies focuses on how 'norms' are connected through them (Vos et al., 2004). This reveals an innovative and crucial way in which qualitative health research can contribute to the debates around effectiveness of technologies and 'evidence-based medicine'. For example, it is argued that currently available dementia drugs are only modestly effective in terms of outcomes on cognition and clinical impression (Loveman et al., 2005). In an ethnography of clinical management of 'cognitive impairment' in an

English memory clinic, it was observed that, more than cognitive loss, an important problem for patients with early dementia was that the illness eroded the practical arrangements that people have constructed during their lives; their ability to maintain workable balances between different aspects of their life deteriorates as forgetfulness starts setting in. This can be exemplified by the case of Mrs Moffat:<sup>2</sup>

Mrs. Moffat, a 60 something year old woman, was an independent and active member of her local community (church, clubs, etc.). Until recently, this engagement in the community had been supported by her use of the motorized car, which she could drive independently to meetings and events in the community. She had however lost her orientation a couple of times, which had been distressing for her and her relatives as her panic had led her to make hasty decisions in busy roads. This presented Mrs. Moffat and her family with a predicament: her autonomy was coming into conflict with her safety. On the one hand, her autonomy, and involvement in the community was obviously an important component in her – subjectively defined – quality of life. On the other hand, there were threats to her and others' safety and body integrity coming from the disorientation episodes. Having been prescribed with dementia drugs, Mrs. Moffat was able to continue to balance these two demands for another few months, and as such, cholinesterase inhibitors served as a temporary link between one normative world – autonomy for the person – and another – safety for self and others (Moreira, unpublished data).

In bringing together two worlds, health technologies – such as dementia drugs – articulate between different 'moral goods' (or forms of 'good life') rather than producing effects in singular measurements of quality of life. This represents a potential challenge to how health technologies are evaluated (Murphy et al., 1998; Lehoux, 2006). Instead of focusing on changes in single or aggregate measures of health induced by a technology, qualitative research can provide data on how technologies sustain the mobility of persons across 'lived worlds'. This entails understanding how different illnesses affect different links between established pragmatic worlds for different groups of people. From a purely social science perspective, illnesses provide us with the 'breaching experiments' (Garfinkel, 1967; Bury, 1982) that are necessary to explore the taken-for-granted aspects of our lives. From a wider perspective, this potentially comes to redefine 'illness identities' in sociological rather than biomedical terms, which could be of assistance for patient participation in technological development and assessment.

## CONCLUSION

In this chapter, we have demonstrated how qualitative researchers are ideally equipped to understand the processes of generation, mediation and use of health technologies. In being able to capture the meanings attributed to and the social processes around the shaping and use of health technologies, qualitative researchers can provide unique accounts of the dynamic relationships between identities, practices, discourses and technologies. These are accounts that seek to describe

and understand how these relationships are enacted in the real world rather than assuming overarching pathways of causation. These accounts are also, for this reason, neither optimistic nor pessimistic about the role of technology in medicine. They provide means of critical, reflexive assessment of technologies-in-action, to be used by practitioners, policymakers and other citizens in their deliberations about the worth of specific technologies. Attributing such a key role for qualitative research in health technology assessment does, however, raise a series of concerns that should be attended to in further research.

First, how to design and develop research on emerging, not fully stabilized health technologies? Due to the configuration of factors identified in the introduction, social and health scientists are increasingly called upon to investigate the social and ethical consequences and/or context of technologies that are still being developed (stem cells, pharmacogenetics, etc.). In this context, Brown and Michael have argued that the construction of expectations is key to the mobilisation of resources and groups around a particular technology but that this process is underpinned by an uneven awareness of the uncertainty of technological 'promises' between experts and lay public (Brown and Michael, 2003). An important stream of research has been focused on detailing how such processes affect different emerging technologies. Less is understood about the effect social and health science research has on the technology – and the promises – it intends to study. In this respect, Law has called our attention to the ambivalent relationship social analysts of technology sustain with the objects of their enquiries (Law, 2002). If, on the one hand, they are invested in pursuing a critical analysis of the uncertainties and contingencies that surround technological projects, there is also an inherent fascination with the beauty and power embedded in those devices. Understanding the methodological, rhetorical and social processes through which qualitative research frames and publicly presents its objects cannot be separated from design and process of conducting research in this area. This does, however, entail developing much further social studies of research-in-action (Maynard and Schaeffer, 2000) with particular attention to qualitative research.

Second, how should qualitative researchers conceive of and investigate the 'contexts' in which health technologies are used and transformed? Most of the research we looked at in the second section of this chapter was conducted through explorations of how technologies entered in particular types of interaction or local forms of health care work. While this provided the background for conceptualizing the relationship between technology and 'practice' as dynamic and fluid, there has been no consistent programme of work to date that investigates in detail how technologies relate to extended, distributed organizational processes (Rapley, 2008). Such an investigation presents considerable challenges, because, as we argued in the foregoing section, the shape and scope of a particular technology can change radically from one site to the next. More creative, methodologies need to be drafted to enable one to follow one technology through its different incarnations without having to assume an inherent stability to the

technology itself. Ideally, investigations need to shift beyond interview-based, single-site, or snapshot studies and towards more longitudinal and multisite studies, with a focus on how technologies shape (and are shaped by) practice over time, courses of action, lay and professional identities and contexts.

Third, and finally, to what extent should qualitative researchers be committed to particular theories or conceptualizations of the relationships between technology and 'society'? In this chapter, we have drawn on studies framed by different traditions within social science – actor-network theory, ethnomethodology, feminism, symbolic interactionism, etc. – without emphasizing their diversity and potential incommensurability. We could have specified the way in which different theories structure research questions and data analysis and perhaps argued for one perspective as opposed to another. It was our intention to draw on a range of frameworks to offer different ways of understanding research problems. Favouring one tradition over another runs risk of hindering the theoretical innovation that comes from debates and controversies within and between disciplines. This is particularly acute in the context of health research where methodological robustness is preferred to theoretical development.

## NOTES

1 Whereas traditional formulations of power would emphasize sovereignty and authority, a governmentality perspective directs analysis towards the productive, fostering powers of the knowledges (savoirs) and techniques that frame economic and social life. Governmentality focuses on the practices that frame individuals' behaviour, their relations to others and to themselves, that enable ways of acting 'at a distance' upon the conduct of individuals.

2 This case is composed from fieldnotes and does not correspond to a living person.

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